Terms used virtual machine manager or VMM and firmware or ROM or PROM or EPROM or EEPROM

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Relevance scale

1 Pen computing: a technology overview and a vision

André Meyer

July 1995 **ACM SIGCHI Bulletin**, Volume 27 Issue 3

Publisher: ACM Press

Full text available: pdf(5.14 MB) Additional Information: full citation, abstract, citings, index terms

This work gives an overview of a new technology that is attracting growing interest in public as well as in the computer industry itself. The visible difference from other technologies is in the use of a pen or pencil as the primary means of interaction between a user and a machine, picking up the familiar pen and paper interface metaphor. From this follows a set of consequences that will be analyzed and put into context with other emerging technologies and visions.Starting with a short historic ...

2 Devirtualizable virtual machines enabling general, single-node, online maintenance

David E. Lowell, Yasushi Saito, Eileen J. Samberg

October 2004 **ACM SIGARCH Computer Architecture News , ACM SIGOPS Operating Systems Review , ACM SIGPLAN Notices , Proceedings of the 11th international conference on Architectural support for programming languages and operating systems ASPLOS-XI**, Volume 32 , 38 , 39 Issue 5 , 5 , 11

Publisher: ACM Press

Full text available: pdf(174.01 KB) Additional Information: full citation, abstract, references, citings, index terms

Maintenance is the dominant source of downtime at high availability sites. Unfortunately, the dominant mechanism for reducing this downtime, cluster rolling upgrade, has two shortcomings that have prevented its broad acceptance. First, cluster-style maintenance over many nodes is typically performed a few nodes at a time, mak-ing maintenance slow and often impractical. Second, cluster-style maintenance does not work on single-node systems, despite the fact that their unavailability during mainte ...

Keywords: availability, online maintenance, planned downtime, virtual machines

3 Virtual machines: ReVirt: enabling intrusion analysis through virtual-machine logging and replay

George W. Dunlap, Samuel T. King, Sukru Cinar, Murtaza A. Basrai, Peter M. Chen

December 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue SI

Publisher: ACM Press

Full text available: pdf(1.56 MB) Additional Information: full citation, abstract, references, citings

Current system loggers have two problems: they depend on the integrity of the operating system being logged, and they do not save sufficient information to replay and analyze attacks that include any non-deterministic events. ReVirt removes the dependency on the target operating system by moving it into a virtual machine and logging below the virtual machine. This allows ReVirt to replay the system's execution before, during, and after an intruder compromises the system, even if the intruder rep ...

4 A survey of commercial parallel processors

Edward Gehringer, Janne Abullarade, Michael H. Gulyn

September 1988 **ACM SIGARCH Computer Architecture News**, Volume 16 Issue 4

Publisher: ACM Press

Full text available: pdf(2.96 MB) Additional Information: full citation, abstract, citings, index terms

This paper compares eight commercial parallel processors along several dimensions. The

processors include four shared-bus multiprocessors (the Encore Multimax, the Sequent Balance system, the Alliant FX series, and the ELXSI System 6400) and four network multiprocessors (the BBN Butterfly, the NCUBE, the Intel iPSC/2, and the FPS T Series). The paper contrasts the computers from the standpoint of interconnection structures, memory configurations, and interprocessor communication. Also, the share ...

5 Virtual machine monitors: Terra: a virtual machine-based platform for trusted computing

Tal Garfinkel, Ben Pfaff, Jim Chow, Mendel Rosenblum, Dan Boneh

October 2003 **Proceedings of the nineteenth ACM symposium on Operating systems principles**

Publisher: ACM Press

Full text available: pdf(140.31 KB) Additional Information: full citation, abstract, references, citings, index terms

We present a flexible architecture for trusted computing, called Terra, that allows applications with a wide range of security requirements to run simultaneously on commodity hardware. Applications on Terra enjoy the semantics of running on a separate, dedicated, tamper-resistant hardware platform, while retaining the ability to run side-by-side with normal applications on a general-purpose computing platform. Terra achieves this synthesis by use of a *trusted virtual machine monitor* (TVMM ...

Keywords: VMM, attestation, authentication, trusted computing, virtual machine, virtual machine monitor

6 Security as a new dimension in embedded system design: Security as a new dimension in embedded system design

Srivaths Ravi, Paul Kocher, Ruby Lee, Gary McGraw, Anand Raghunathan

June 2004 **Proceedings of the 41st annual conference on Design automation**

Publisher: ACM Press

Full text available: pdf(209.10 KB) Additional Information: full citation, abstract, references, citings, index terms

The growing number of instances of breaches in information security in the last few years has created a compelling case for efforts towards secure electronic systems. Embedded systems, which will be ubiquitously used to capture, store, manipulate, and access data of a sensitive nature, pose several unique and interesting security challenges. Security has been the subject of intensive research in the areas of cryptography, computing, and networking. However, despite these efforts, *security is ...*

***Keywords**: PDAs, architectures, battery life, cryptography, design, design methodologies, digital rights management, embedded systems, performance, security, security processing, security protocols, sensors, software attacks, tamper resistance, trusted computing, viruses*

7 Scalability, performance, and real-time: Friendly virtual machines: leveraging a feedback-control model for application adaptation

Yuting Zhang, Azer Bestavros, Mina Guirguis, Ibrahim Matta, Richard West

June 2005 **Proceedings of the 1st ACM/USENIX international conference on Virtual execution environments**

Publisher: ACM Press

Full text available: pdf(317.34 KB) Additional Information: full citation, abstract, references, index terms

With the increased use of "Virtual Machines" (VMs) as vehicles that isolate applications running on the same host, it is necessary to devise techniques that enable multiple VMs to share underlying resources both fairly and efficiently. To that end, one common approach is to deploy complex resource management techniques in the hosting infrastructure. Alternately, in this paper, we advocate the use of self-adaptation in the VMs themselves based on feedback about resource usage and availability. Co ...

Keywords: feedback Control, friendy virtual machines, resource management

8 Mobile services: Reincarnating PCs with portable SoulPads

Ramón Cáceres, Casey Carter, Chandra Narayanaswami, Mandayam Raghunath

June 2005 **Proceedings of the 3rd international conference on Mobile systems, applications, and services MobiSys '05**

Publisher: ACM Press

Full text available: pdf(199.97 KB) Additional Information: full citation, abstract, references

The ability to walk up to any computer, personalize it, and use it as one's own has long been a goal of mobile computing research. We present *SoulPad*, a new approach based on carrying an auto-configuring operating system along with a suspended virtual machine on a small portable device. With this approach, the computer boots from the device and resumes the virtual machine, thus giving the user access to his personal environment, including previously running computations. *SoulPad* ha ...

9 EASY—an operating system for the QM-1

Charles W. Flink

September 1977 **ACM SIGMICRO Newsletter , Proceedings of the 10th annual workshop on Microprogramming MICRO 10**, Volume 8 Issue 3

Publisher: IEEE Press, ACM Press

Full text available: pdf(733.19 KB) Additional Information: full citation, abstract, references, citings, index terms

The Emulation Aid SYstem is a virtual machine monitor for the Nanodata QM-1 microprogrammable computer. The system is designed to provide the user with an interactive interface for the development and subsequent use of emulations on the QM-1. EASY provides integrated support for: 1) interactive control of multiple, concurrently resident, virtual computers implemented via emulation, 2) input/output from emulations (virtual I/O) to the various real peripherals of the QM-1, and 3) diagnostic d ...

Keywords: Emulation, Intermediate language machines, Microprogramming, Nanodata QM-1, Software engineering, Virtual machine monitors, Virtual machines

10 Programming languages: Compiler-assisted demand paging for embedded systems with flash memory

Chanik Park, Junghee Lim, Kiwon Kwon, Jaejin Lee, Sang Lyul Min

September 2004 **Proceedings of the 4th ACM international conference on Embedded software EMSOFT '04**

Publisher: ACM Press

Full text available: pdf(392.66 KB) Additional Information: full citation, abstract, references, citings, index terms

In this paper, we propose a novel, application specific demand paging mechanism for low-end embedded systems with flash memory as secondary storage. These systems are not equipped with virtual memory. A small memory space called an execution buffer is allocated to page an application. An application-specific page manager manages the buffer. The manager is generated by a compiler post-pass and combined with the application image. Our compiler post-pass analyzes the ELF executable image of an appl ...

Keywords: SRAM, clustering, compilers, embedded systems, flash memory, heterogeneous memory, paging, post-pass optimization

11 Forth report: Deus Ex Macintosh

Paul Frenger

March 2004 **ACM SIGPLAN Notices**, Volume 39 Issue 3

Publisher: ACM Press

Full text available: pdf(329.67 KB) Additional Information: full citation, references

12 The seventh annual workshop on microprogramming

October 1974 **ACM SIGMICRO Newsletter**, Volume 5 Issue 3

Publisher: ACM Press

Full text available: pdf(1.14 MB) Additional Information: full citation

13 Pioneer: verifying code integrity and enforcing untampered code execution on legacy systems

Arvind Seshadri, Mark Luk, Elaine Shi, Adrian Perrig, Leendert van Doorn, Pradeep Khosla

October 2005 **ACM SIGOPS Operating Systems Review , Proceedings of the twentieth ACM symposium on Operating systems principles SOSP '05**, Volume 39 Issue 5

Publisher: ACM Press

Full text available: pdf(264.30 KB) Additional Information: full citation, abstract, references, index terms

We propose a primitive, called Pioneer, as a first step towards verifiable code execution on untrusted legacy hosts. Pioneer does not require any hardware support such as secure co-processors or CPU-architecture extensions. We implement Pioneer on an Intel Pentium IV Xeon processor. Pioneer can be used as a basic building block to build security systems. We demonstrate this by building a kernel rootkit detector.

Keywords: dynamic root of trust, rootkit detection, self-check-summing code, software-based code attestation, verifiable code execution

14 Real-time shading

Marc Olano, Kurt Akeley, John C. Hart, Wolfgang Heidrich, Michael McCool, Jason L. Mitchell, Randi Rost

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes SIGGRAPH '04**

Publisher: ACM Press

Full text available: pdf(7.39 MB) Additional Information: full citation, abstract

Real-time procedural shading was once seen as a distant dream. When the first version of this course was offered four years ago, real-time shading was possible, but only with one-of-a-kind hardware or by combining the effects of tens to hundreds of rendering passes. Today, almost every new computer comes with graphics hardware capable of interactively executing shaders of thousands to tens of thousands of instructions. This course has been redesigned to address today's real-time shading capabili ...

15 Session summaries from the 17th symposium on operating systems principle (SOSP'99)

Jay Lepreau, Eric Eide

April 2000 **ACM SIGOPS Operating Systems Review**, Volume 34 Issue 2

Publisher: ACM Press

Full text available: pdf(3.15 MB) Additional Information: full citation, index terms

16 Burroughs Corporation: corporate public relations

October 1974 **ACM SIGMICRO Newsletter**, Volume 5 Issue 3

Publisher: ACM Press

Full text available: pdf(7.37 MB) Additional Information: full citation

17 Design and Implementation of the AEGIS Single-Chip Secure Processor Using Physical Random Functions

G. Edward Suh, Charles W. O'Donnell, Ishan Sachdev, Srinivas Devadas

May 2005 **ACM SIGARCH Computer Architecture News , Proceedings of the 32nd Annual International Symposium on Computer Architecture ISCA '05**, Volume 33 Issue 2

Publisher: IEEE Computer Society, ACM Press

Full text available: pdf(288.96 KB) Additional Information: full citation, abstract, index terms

Secure processors enable new applications by ensuring private and authentic program execution even in the face of physical attack. In this paper we present the AEGIS secure processor architecture, and evaluate its RTL implementation on FPGAs. By using Physical Random Functions, we propose a new way of reliably protecting and sharing secrets that is more secure than existing solutions based on non-volatile memory. Our architecture gives applications the flexibility of trusting and protecting only ...

18 Is it live or is it Memorex?

Tory Sawyer, Randy Anderson, Gary McCuaig

September 1986 **Proceedings of the 14th annual ACM SIGUCCS conference on User services: setting the direction**

Publisher: ACM Press

Full text available: pdf(2.60 MB) Additional Information: full citation, index terms

19 Logical and physical design issues for smart card databases

Cristiana Bolchini, Fabio Salice, Fabio A. Schreiber, Letizia Tanca

July 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 3

Publisher: ACM Press

Full text available: pdf(1.12 MB) Additional Information: full citation, abstract, references, citings, index terms

The design of very small databases for smart cards and for portable embedded systems is deeply constrained by the peculiar features of the physical medium. We propose a joint approach to the logical and physical database design phases and evaluate several data structures with respect to the performance, power consumption, and endurance parameters of read/program operations on the Flash-EEPROM storage medium.

Keywords: Design methodology, access methods, data structures, flash memory, personal information systems, smart card

20 Porting AIX onto the student electronic notebook

John Ioannidis, Gerald Q. Maguire, Israel Ben-Shaul, Marios Levedopoulos, Micky Liu

May 1991 **Proceedings of the 1991 ACM SIGSMALL/PC symposium on Small systems**

Publisher: ACM Press

Full text available: pdf(755.19 KB) Additional Information: full citation, references, index terms

Terms used virtual machine manager or VMM and firmware or ROM or PROM or EPROM or EEPROM

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21 IS '97: model curriculum and guidelines for undergraduate degree programs in information systems
Gordon B. Davis, John T. Gorgone, J. Daniel Couger, David L. Feinstein, Herbert E. Longenecker
December 1996 **ACM SIGMIS Database , Guidelines for undergraduate degree programs on Model curriculum and guidelines for undergraduate degree programs in information systems IS '97**, Volume 28 Issue 1
Publisher: ACM Press
Full text available: pdf(7.24 MB) Additional Information: full citation, citings

22 Forth: Ten years of Forth in ACM Sigplan Notices: part 2
Paul Frenger
April 2006 **ACM SIGPLAN Notices**, Volume 41 Issue 4
Publisher: ACM Press
Full text available: pdf(268.55 KB) Additional Information: full citation, abstract, references

Last column, we began a two-part retrospective to recap the first ten years of the *ACM Sigplan Notices Forth Report*. Our walk through memory lane began with a history lesson: who Chuck Moore is, the origins of the Forth programming language, Forth software and hardware incarnations, some vendors, conferences, and a few tall tales. We looked at little pioneer *ACM SIG-Forth* and its four-year *Newsletter*, and how phoenix-like their ashes gave rise to the ten-year run of the *F* ...

23 When hardware becomes software: designing a safety-critical system with Ada
James Hummer, Loïc Briand
December 1992 **Proceedings of the conference on TRI-Ada '92**
Publisher: ACM Press
Full text available: pdf(748.30 KB) Additional Information: full citation, references, index terms

24 Implementation aspects of a SPARC V9 complete machine simulator
Bill Clarke, Adam Czezowski, Peter Strazdins
January 2002 **Australian Computer Science Communications , Proceedings of the twenty-fifth Australasian conference on Computer science - Volume 4 ACSC '02**, Volume 24 Issue 1
Publisher: Australian Computer Society, Inc., IEEE Computer Society Press
Full text available: pdf(1.33 MB) Additional Information: full citation, abstract, references, index terms

In this paper we present work in progress in the development of a complete machine simulator for the UltraSPARC, an implementation of the SPARC V9 architecture. The complexity of the UltraSPARC ISA presents many challenges in developing a reliable and yet reasonably efficient implementation of such a simulator. Our implementation includes a heavily object-oriented design for the simulator modules and infrastructure, caching of repeated computations for performance, adding an OS (system call) emu ...

Keywords: SMP, SPARC V9 ISA, UltraSPARC, complete machine simulator, execution-driven simulation, object-oriented design

25 Formal properties of recursive Virtual Machine architectures.
Gerald Belpaire, Nai-Ting Hsu

November 1975 **Proceedings of the fifth ACM symposium on Operating systems principles**

Publisher: ACM Press

Full text available: pdf(744.44 KB) Additional Information: full citation, abstract, references, index terms

A formal model of hardware/software architectures is developed and applied to Virtual Machine Systems. Results are derived on the sufficient conditions that a machine architecture must verify in order to support VM systems. The model deals explicitly with resource mappings (protection) and with I/O devices. Some already published results are retrieved and other ones, more general, are obtained.

Keywords: Architecture, Formal requirements, Operating systems, Virtual machine, Virtual machine monitor

26 Prototyping and validation techniques: Rappit: framework for synthesis of host-assisted scripting engines for adaptive embedded systems

Jiwon Hahn, Qiang Xie, Pai H. Chou

September 2005 **Proceedings of the 3rd IEEE/ACM/IFIP international conference on Hardware/software codesign and system synthesis CODES+ISSS '05**

Publisher: ACM Press

Full text available: pdf(1.27 MB) Additional Information: full citation, abstract, references, index terms

Scripting is a powerful, high-level, cross-platform, dynamic, easy way of composing software modules as black boxes. Unfortunately, the high runtime overhead has prevented scripting from being widely adopted in embedded applications. This work proposes to overcome these obstacles by synthesizing light-weight, host-assisted scripting engines for embedded systems. The result is dramatically shortened development cycle due to the much higher-level abstraction, interactive access and dynamic reconfi ...

Keywords: adaptive systems, scripting, software synthesis

27 Scalability, fidelity, and containment in the potemkin virtual honeyfarm

Michael Vrable, Justin Ma, Jay Chen, David Moore, Erik Vandekieft, Alex C. Snoeren, Geoffrey M. Voelker, Stefan Savage

October 2005 **ACM SIGOPS Operating Systems Review , Proceedings of the twentieth ACM symposium on Operating systems principles SOSP '05**, Volume 39 Issue 5

Publisher: ACM Press

Full text available: pdf(506.39 KB) Additional Information: full citation, abstract, references, index terms

The rapid evolution of large-scale worms, viruses and bot-nets have made Internet malware a pressing concern. Such infections are at the root of modern scourges including DDoS extortion, on-line identity theft, SPAM, phishing, and piracy. However, the most widely used tools for gathering intelligence on new malware -- network honeypots -- have forced investigators to choose between monitoring activity at a large scale or capturing behavior with high fidelity. In this paper, we describe an approa ...

Keywords: copy-on-write, honeyfarm, honeypot, malware, virtual machine monitor

28 Columns: Risks to the public in computers and related systems

Peter G. Neumann

March 2002 **ACM SIGSOFT Software Engineering Notes**, Volume 27 Issue 2

Publisher: ACM Press

Full text available: pdf(1.54 MB) Additional Information: full citation

29 Cellular Disco: resource management using virtual clusters on shared-memory multiprocessors

Kinshuk Govil, Dan Teodosiu, Yongqiang Huang, Mendel Rosenblum

December 1999 **ACM SIGOPS Operating Systems Review , Proceedings of the seventeenth ACM symposium on Operating systems principles SOSP '99**, Volume 33 Issue 5

Publisher: ACM Press

Full text available: pdf(1.93 MB) Additional Information: full citation, abstract, references, citings, index terms

Despite the fact that large-scale shared-memory multiprocessors have been commercially available for several years, system software that fully utilizes all their features is still not available, mostly due to the complexity and cost of making the required changes to the operating system. A recently proposed approach, called Disco, substantially reduces this development cost by using a virtual machine monitor that leverages the existing operating system technology.In this paper we present a syste ...

30 Cellular disco: resource management using virtual clusters on shared-memory

multiprocessors
Kinshuk Govil, Dan Teodosiu, Yongqiang Huang, Mendel Rosenblum
August 2000 **ACM Transactions on Computer Systems (TOCS)**, Volume 18 Issue 3

Publisher: ACM Press
Full text available: pdf(287.05 KB) Additional Information: full citation, abstract, references, citings, index terms, review

Despite the fact that large-scale shared-memory multiprocessors have been commercially available for several years, system software that fully utilizes all their features is still not available, mostly due to the complexity and cost of making the required changes to the operating system. A recently proposed approach, called Disco, substantially reduces this development cost by using a virtual machine monitor that laverages the existing operating system technology. In this paper we present a ...

Keywords: fault containment, resource managment, scalable multiprocessors, virtual machines

31 Formalizing the safety of Java, the Java virtual machine, and Java card
Pieter H. Hartel, Luc Moreau
December 2001 **ACM Computing Surveys (CSUR)**, Volume 33 Issue 4

Publisher: ACM Press
Full text available: pdf(442.86 KB) Additional Information: full citation, abstract, references, citings, index terms

We review the existing literature on Java safety, emphasizing formal approaches, and the impact of Java safety on small footprint devices such as smartcards. The conclusion is that although a lot of good work has been done, a more concerted effort is needed to build a coherent set of machine-readable formal models of the whole of Java and its implementation. This is a formidable task but we believe it is essential to build trust in Java safety, and thence to achieve ITSEC level 6 or Common Crite ...

Keywords: Common criteria, programming

32 Two approaches to the implementation of a distributed simulation system
Murali Krishnamurthi, Usha Chandrasekaran, Sallie Sheppard
December 1985 **Proceedings of the 17th conference on Winter simulation**

Publisher: ACM Press
Full text available: pdf(1.16 MB) Additional Information: full citation, abstract, references, citings

This paper describes two approaches to the implementation of distributed simulation currently being pursued at Texas A&M University. The first approach describes the design and the implementation of a distributed simulation system onto a Motorola 68000 based architecture. This approach involves transparently distributing the language support functions of an existing simulation language (GASP) onto multiple processors. The second approach discusses the implementation of simulation suppor ...

33 VMPlants: Providing and Managing Virtual Machine Execution Environments for Grid Computing
Ivan Krsul, Arijit Ganguly, Jian Zhang, Jose A. B. Fortes, Renato J. Figueiredo
November 2004 **Proceedings of the 2004 ACM/IEEE conference on Supercomputing**

Publisher: IEEE Computer Society
Full text available: pdf(207.42 KB) Additional Information: full citation, abstract

Virtual machines provide flexible, powerful execution environments for Grid computing, offering isolation and security mechanisms complementary to operating systems, customization and encapsulation of entire application environments, and support for legacy applications. This paper describes a Grid service ¿ VMPlant ¿ that provides for automated configuration and creation of flexible VMs that, once configured to meet application needs, can then subsequently be copied ("cloned") and dynamically in ...

34 Mobile file system support with virtual device drivers
Dorota M. Huizinga, Christine Ames
February 1999 **Proceedings of the 1999 ACM symposium on Applied computing**

Publisher: ACM Press
Full text available: pdf(1.04 MB) Additional Information: full citation, references, index terms

Keywords: disconnected operation, file system extensibility, mobile computing, virtual device drivers

35 A java virtual machine architecture for very small devices
Nik Shaylor, Douglas N. Simon, William R. Bush

June 2003 **ACM SIGPLAN Notices , Proceedings of the 2003 ACM SIGPLAN conference on Language, compiler, and tool for embedded systems LCTES '03**, Volume 38 Issue 7

Publisher: ACM Press

Full text available: pdf(182.85 KB) Additional Information: full citation, abstract, references, index terms

The smallest complete Java™ virtual machine implementations in use today are based on the CLDC standard and are deployed in mobile phones and PDAs. These implementations require several tens of kilobytes. Smaller Java-like implementations also exist, but these involve compromises in Java semantics. This paper describes a JVM™ architecture designed for very small devices. It supports all the CLDC Java platform semantics, including exact garbage collection, dynamic class loading, and v ...

Keywords: CLDC, JVM, java, limited-memory devices, next generation smart cards

36 Distributed operating systems

Andrew S. Tanenbaum, Robbert Van Renesse

December 1985 **ACM Computing Surveys (CSUR)**, Volume 17 Issue 4

Publisher: ACM Press

Full text available: pdf(5.49 MB) Additional Information: full citation, abstract, references, citings, index terms, review

Distributed operating systems have many aspects in common with centralized ones, but they also differ in certain ways. This paper is intended as an introduction to distributed operating systems, and especially to current university research about them. After a discussion of what constitutes a distributed operating system and how it is distinguished from a computer network, various key design issues are discussed. Then several examples of current research projects are examined in some detail ...

37 The PDP-11 virtual machine architecture: A case study

Gerald J. Popek, Charles S. Kline

November 1975 **Proceedings of the fifth ACM symposium on Operating systems principles**

Publisher: ACM Press

Full text available: pdf(905.34 KB) Additional Information: full citation, abstract, references, citings, index terms

At UCLA, a virtual machine system prototype has been constructed for the Digital Equipment Corporation PDP-11/45. In order to successfully implement that system, a number of hardware changes have been necessary. Some overcome basic inadequacies in the original hardware for this purpose, and others enhance the performance of the virtual machine software. Steps in the development of the modified hardware architecture, as well as relevant aspects of the software structure, are discussed. In ad ...

Keywords: Computer architecture, Computer security, PDP-11/45, Virtual machine monitor, Virtual machines

38 Design and realization of MLM: a multilingual machine

F. M G Franca, N. Q. Vasconcelos, E. S T Fernandes

December 1986 **ACM SIGMICRO Newsletter , Proceedings of the 19th annual workshop on Microprogramming MICRO 19**, Volume 17 Issue 4

Publisher: ACM Press

Full text available: pdf(986.59 KB) Additional Information: full citation, abstract, references, index terms

This paper describes the design and realization of MLM, a Multi-Lingual machine whose main goal is to provide support for teaching and research in Microprogramming and Computer Architecture. MLM is based on a standard (non-microprogrammable) minicomputer whose microarchitecture has been modified in order to satisfy the requirements of a multi-lingual environment. The resulting machine is microprogrammable, offers facilities for interpreting different target repertoires, and has m ...

39 Firmware factory & forth

Brad Eckert

December 1999 **ACM SIGPLAN Notices**, Volume 34 Issue 12

Publisher: ACM Press

Full text available: pdf(373.72 KB) Additional Information: full citation, citings, index terms

40 upFRONT

November 1999 **Linux Journal**

Publisher: Specialized Systems Consultants, Inc.

Full text available: html(44.71 KB) Additional Information: full citation, index terms

Terms used RAID and virtual machine manager or VMM

Found 28,888 of 185,178

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1 Scalability, fidelity, and containment in the potemkin virtual honeyfarm

Michael Vrable, Justin Ma, Jay Chen, David Moore, Erik Vandekieft, Alex C. Snoeren, Geoffrey M. Voelker, Stefan Savage

October 2005 **ACM SIGOPS Operating Systems Review , Proceedings of the twentieth ACM symposium on Operating systems principles SOSP '05**, Volume 39 Issue 5

Publisher: ACM Press

Full text available: pdf(506.39 KB) Additional Information: full citation, abstract, references, index terms

The rapid evolution of large-scale worms, viruses and bot-nets have made Internet malware a pressing concern. Such infections are at the root of modern scourges including DDoS extortion, on-line identity theft, SPAM, phishing, and piracy. However, the most widely used tools for gathering intelligence on new malware -- network honeypots -- have forced investigators to choose between monitoring activity at a large scale or capturing behavior with high fidelity. In this paper, we describe an approa ...

Keywords: copy-on-write, honeyfarm, honeypot, malware, virtual machine monitor

2 Virtual machines - an idea whose time has returned: application to network, security, and database courses

William I. Bullers, Stephen Burd, Alessandro F. Seazzu

March 2006 **ACM SIGCSE Bulletin , Proceedings of the 37th SIGCSE technical symposium on Computer science education SIGCSE '06**, Volume 38 Issue 1

Publisher: ACM Press

Full text available: pdf(78.71 KB) Additional Information: full citation, abstract, references, index terms

Virtual machines provide a secure environment within which students may install, configure, and experiment with operating system, network, and database software. This paper describes experiences teaching three advanced courses in system and network administration, information security and assurance, and database administration using VMware workstation in a shared student laboratory. The paper describes benefits and challenges in course and lab configuration, security, and administration.

Keywords: VMware, database, network, security, virtual machines

3 Special topic: PlanetLab: Privileged operations in the PlanetLab virtualised environment

Steve Muir, Larry Peterson, Marc Fiuczynski, Justin Cappos, John Hartman

January 2006 **ACM SIGOPS Operating Systems Review**, Volume 40 Issue 1

Publisher: ACM Press

Full text available: pdf(493.81 KB) Additional Information: full citation, abstract, references, index terms

Virtualised systems have experienced a resurgence in popularity in recent years, whether used to support multiple OSes running on a user's desktop, provide commercial application hosting facilities, or isolate a large number of users from each other in global network testbeds. We also see an increasing level of interest in having entities within these virtualised systems interact with each other, either as peers or as helpers providing a service to clients.Very little work has been previously co ...

4 Virtual machines: ReVirt: enabling intrusion analysis through virtual-machine logging and replay

George W. Dunlap, Samuel T. King, Sukru Cinar, Murtaza A. Basrai, Peter M. Chen

December 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue SI

Publisher: ACM Press

Full text available: pdf(1.56 MB) Additional Information: full citation, abstract, references, citings

Current system loggers have two problems: they depend on the integrity of the operating system being logged, and they do not save sufficient information to replay and analyze attacks that include any non-deterministic events. ReVirt removes the dependency on the target operating system by moving it into a virtual machine and logging below the virtual machine. This allows ReVirt to replay the system's execution before, during, and after an intruder compromises the system, even if the intruder rep ...

5 Virtual machine monitors: Terra: a virtual machine-based platform for trusted computing

Tal Garfinkel, Ben Pfaff, Jim Chow, Mendel Rosenblum, Dan Boneh

October 2003 **Proceedings of the nineteenth ACM symposium on Operating systems principles**

Publisher: ACM Press

Full text available: pdf(140.31 KB) Additional Information: full citation, abstract, references, citings, index terms

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Keywords: VMM, attestation, authentication, trusted computing, virtual machine, virtual machine monitor

6 Devirtualizable virtual machines enabling general, single-node, online maintenance

David E. Lowell, Yasushi Saito, Eileen J. Samberg

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Maintenance is the dominant source of downtime at high availability sites. Unfortunately, the dominant mechanism for reducing this downtime, cluster rolling upgrade, has two shortcomings that have prevented its broad acceptance. First, cluster-style maintenance over many nodes is typically performed a few nodes at a time, mak-ing maintenance slow and often impractical. Second, cluster-style maintenance does not work on single-node systems, despite the fact that their unavailability during mainte ...

Keywords: availability, online maintenance, planned downtime, virtual machines

7 Scalability, performance, and real-time: Friendly virtual machines: leveraging a feedback-control model for application adaptation

Yuting Zhang, Azer Bestavros, Mina Guirguis, Ibrahim Matta, Richard West

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With the increased use of "Virtual Machines" (VMs) as vehicles that isolate applications running on the same host, it is necessary to devise techniques that enable multiple VMs to share underlying resources both fairly and efficiently. To that end, one common approach is to deploy complex resource management techniques in the hosting infrastructure. Alternately, in this paper, we advocate the use of self-adaptation in the VMs themselves based on feedback about resource usage and availability. Co ...

Keywords: feedback Control, friendy virtual machines, resource management

8 Virtual machines: Scale and performance in the Denali isolation kernel

Andrew Whitaker, Marianne Shaw, Steven D. Gribble

December 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue SI

Publisher: ACM Press

Full text available: pdf(1.91 MB) Additional Information: full citation, abstract, references, citings

This paper describes the Denali isolation kernel, an operating system architecture that safely multiplexes a large number of untrusted Internet services on shared hardware. Denali's goal is to allow new Internet services to be "pushed" into third party infrastructure, relieving Internet service authors from the burden of acquiring and maintaining physical infrastructure. Our isolation kernel exposes a virtual machine abstraction, but unlike conventional virtual machine monitors,

Denali does not ...

9 Security and eliability: Using VMM-based sensors to monitor honeypots

Kurniadi Asrigo, Lionel Litty, David Lie

June 2006 **Proceedings of the 2nd international conference on Virtual execution environments VEE '06**

Publisher: ACM Press

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Virtual Machine Monitors (VMMs) are a common tool for implementing honeypots. In this paper we examine the implementation of a VMM-based intrusion detection and monitoring system for collecting information about attacks on honeypots. We document and evaluate three designs we have implemented on two open-source virtualization platforms: User-Mode Linux and Xen. Our results show that our designs give the monitor good visibility into the system and thus, a small number of monitoring sensors can det ...

Keywords: IDS, honeypot monitoring, intrusion detection, virtual machine monitor

10 Testbed directions and experience: PlanetLab: an overlay testbed for broad-coverage services

Brent Chun, David Culler, Timothy Roscoe, Andy Bavier, Larry Peterson, Mike Wawrzoniak, Mic Bowman

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PlanetLab is a global overlay network for developing and accessing broad-coverage network services. Our goal is to grow to 1000 geographically distributed nodes, connected by a disverse collection of links. PlanetLab allows multiple service to run concurrently and continuously, each in its own slice of PlanetLab. This paper discribes our initial implementation of PlanetLab, including the mechanisms used to impelment virtualization, and the collection of core services used to manage PlanetLab.

11 Security and eliability: Live updating operating systems using virtualization

Haibo Chen, Rong Chen, Fengzhe Zhang, Binyu Zang, Pen-Chung Yew

June 2006 **Proceedings of the 2nd international conference on Virtual execution environments VEE '06**

Publisher: ACM Press

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Many critical IT infrastructures require non-disruptive operations. However, the operating systems thereon are far from perfect that patches and upgrades are frequently applied, in order to close vulnerabilities, add new features and enhance performance. To mitigate the loss of availability, such operating systems need to provide features such as live update through which patches and upgrades can be applied without having to stop and reboot the operating system. Unfortunately, most current live ...

Keywords: availability, live update, operating system, virtualization

12 Novel approaches: A case for virtual channel processors

Derek McAuley, Rolf Neugebauer

August 2003 **Proceedings of the ACM SIGCOMM workshop on Network-I/O convergence: experience, lessons, implications**

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Modern desktop and server computer systems use multiple processors: general purpose CPU(s), graphic processor (GPU), network processors (NP) on Network Interface Cards (NICs), RAID controllers, and signal processors on sound cards and modems. Some of these processors traditionally have been special purpose processors but there is a trend towards replacing some of these with embedded general purpose processors. At the same time main CPUs become more powerful; desktop CPUs start featuring Simultan ...

Keywords: I/O virtualisation, Virtual Channel Processors, protocol offloading

13 Extensible file systems in spring

Yousef A. Khalidi, Michael N. Nelson

December 1993 **ACM SIGOPS Operating Systems Review , Proceedings of the fourteenth ACM symposium on Operating systems principles SOSP '93**, Volume 27 Issue 5

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pdf(1.47 MB) full citation, abstract, references, citings, index terms

In this paper we describe an architecture for extensible file systems. The architecture enables the extension of file system functionality by composing (or stacking) new file systems on top of existing file systems. A file system that is stacked on top of an existing file system can access the existing file system's files via a well-defined naming interface and can share the same underlying file data in a coherent manner. We describe extending file systems in the context of the Spring operating ...

14 VMPlants: Providing and Managing Virtual Machine Execution Environments for Grid Computing

Ivan Krsul, Arijit Ganguly, Jian Zhang, Jose A. B. Fortes, Renato J. Figueiredo

November 2004 **Proceedings of the 2004 ACM/IEEE conference on Supercomputing**

Publisher: IEEE Computer Society

Full text available: pdf(207.42 KB) Additional Information: full citation, abstract

Virtual machines provide flexible, powerful execution environments for Grid computing, offering isolation and security mechanisms complementary to operating systems, customization and encapsulation of entire application environments, and support for legacy applications. This paper describes a Grid service ¿ VMPlant ¿ that provides for automated configuration and creation of flexible VMs that, once configured to meet application needs, can then subsequently be copied ("cloned") and dynamically in ...

15 Cellular Disco: resource management using virtual clusters on shared-memory multiprocessors

Kinshuk Govil, Dan Teodosiu, Yongqiang Huang, Mendel Rosenblum

December 1999 **ACM SIGOPS Operating Systems Review , Proceedings of the seventeenth ACM symposium on Operating systems principles SOSP '99**, Volume 33 Issue 5

Publisher: ACM Press

Full text available: pdf(1.93 MB) Additional Information: full citation, abstract, references, citings, index terms

Despite the fact that large-scale shared-memory multiprocessors have been commercially available for several years, system software that fully utilizes all their features is still not available, mostly due to the complexity and cost of making the required changes to the operating system. A recently proposed approach, called Disco, substantially reduces this development cost by using a virtual machine monitor that leverages the existing operating system technology.In this paper we present a syste ...

16 Cellular disco: resource management using virtual clusters on shared-memory multiprocessors

Kinshuk Govil, Dan Teodosiu, Yongqiang Huang, Mendel Rosenblum

August 2000 **ACM Transactions on Computer Systems (TOCS)**, Volume 18 Issue 3

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Full text available: pdf(287.05 KB) Additional Information: full citation, abstract, references, citings, index terms, review

Despite the fact that large-scale shared-memory multiprocessors have been commercially available for several years, system software that fully utilizes all their features is still not available, mostly due to the complexity and cost of making the required changes to the operating system. A recently proposed approach, called Disco, substantially reduces this development cost by using a virtual machine monitor that laverages the existing operating system technology. In this paper we present a ...

Keywords: fault containment, resource managment, scalable multiprocessors, virtual machines

17 Virtualizing the VAX architecture

Judith S. Hall, Paul T. Robinson

April 1991 **ACM SIGARCH Computer Architecture News , Proceedings of the 18th annual international symposium on Computer architecture ISCA '91**, Volume 19 Issue 3

Publisher: ACM Press

Full text available: pdf(1.17 MB) Additional Information: full citation, references, citings, index terms

18 Mobile file system support with virtual device drivers

Dorota M. Huizinga, Christine Ames

February 1999 **Proceedings of the 1999 ACM symposium on Applied computing**

Publisher: ACM Press

Full text available: pdf(1.04 MB) Additional Information: full citation, references, index terms

Keywords: disconnected operation, file system extensibility, mobile computing, virtual device

drivers

19 CAD for reconfigurable computing: Virtual memory window for application-specific reconfigurable coprocessors

Miljan Vuletić, Laura Pozzi, Paolo Ienne

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Publisher: ACM Press

Full text available: pdf(180.11 KB) Additional Information: full citation, abstract, references, index terms

Reconfigurable *Systems-on-Chip* (SoCs) on the market consist of full-fledged processors and large *Field-Programmable Gate-Arrays* (FPGAs). The latter can be used to implement the system glue logic, various peripherals, and application-specific coprocessors. Using FPGAs for application-specific coprocessors has certain speedup potentials, but it is less present in practice because of the complexity of interfacing the software application with the coprocessor. Another obstacle is the l ...

Keywords: OS, codesign, coprocessors, reconfigurable computing

20 The Zebra striped network file system

John H. Hartman, John K. Ousterhout

August 1995 **ACM Transactions on Computer Systems (TOCS)**, Volume 13 Issue 3

Publisher: ACM Press

Full text available: pdf(2.76 MB) Additional Information: full citation, abstract, references, citings, index terms, review

Zebra is a network file system that increases throughput by striping the file data across multiple servers. Rather than striping each file separately, Zebra forms all the new data from each client into a single stream, which it then stripes using an approach similar to a log-structured file system. This provides high performance for writes of small files as well as for reads and writes of large files. Zebra also writes parity information in each stripe in the style of RAID disk arrays; this ...

Keywords: RAID, log-based striping, log-structured file system, parity computation